IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF NEW MEXICO

UNITED STATES OF AMERICA,

Plaintiff,

vs. No. CR 15-4268 JB

ANGEL DELEON, JOE LAWRENCE GALLEGOS, EDWARD TROUP, a.k.a. "Huero Troup," LEONARD LUJAN, BILLY GARCIA, a.k.a. "Wild Bill," EUGENE MARTINEZ, a.k.a. "Little Guero," ALLEN PATTERSON, CHRISTOPHER CHAVEZ, a.k.a. "Critter," JAVIER ALONSO, a.k.a. "Wineo," ARTURO ARNULFO GARCIA, a.k.a. "Shotgun," BENJAMIN CLARK, a.k.a. "Cyclone," RUBEN HERNANDEZ; JERRY ARMENTA, a.k.a. "Creeper," JERRY MONTOYA, a.k.a. "Boxer," MARIO RODRIGUEZ, a.k.a. "Blue," TIMOTHY MARTINEZ, a.k.a. "Red," MAURICIO VARELA, a.k.a. "Archie," a.k.a. "Hog Nuts," DANIEL SANCHEZ, a.k.a. "Dan Dan," GERALD ARCHULETA, a.k.a. "Styx," a.k.a. "Grandma," CONRAD VILLEGAS, a.k.a. "Chitmon," ANTHONY RAY BACA, a.k.a. "Pup," ROBERT MARTINEZ, a.k.a. "Baby Rob," ROY PAUL MARTINEZ, a.k.a. "Shadow," CHRISTOPHER GARCIA, CARLOS HERRERA, a.k.a. "Lazy," RUDY PEREZ, a.k.a. "Ru Dog," ANDREW GALLEGOS, a.k.a. "Smiley," SANTOS GONZALEZ; PAUL RIVERA, SHAUNA GUTIERREZ, and BRANDY RODRIGUEZ,

Defendants.

MEMORANDUM OPINION AND ORDER

THIS MATTER comes before the Court on the United States' Motion to Exclude Expert Witness or in the Alternative to Hold a Daubert Hearing, filed June 28, 2021 (Doc. 3293)("Motion"). The Court held a hearing on August 2, 2021. See Clerk's Minutes at 1, filed August 2, 2021 (Doc. 3408). The primary issue is whether Dr. Michael Spence may testify at

Defendant Angel DeLeon's trial about the procedures the New Mexico Department of Public Safety's Crime Laboratory ("Crime Lab") followed when collecting and testing evidence recovered from the scene of Frank Castillo's murder at the Southern New Mexico Correctional Facility in 2001, and, if the Court allows Dr. Spence to testify, whether he may testify: (i) about the risk of cross-contamination generally, and about the procedures the Crime Lab followed when testing evidence recovered from the scene of the alleged murder of Frank Castillo in March, 2001, and whether those procedures could have allowed for DNA cross-contamination; (ii) about the procedures the Crime Lab did or did not follow; and (iii) whether Tokumaru's reanalysis of the collected DNA samples demonstrates that the detection of DeLeon's DNA on the murder weapon is not scientifically reproducible. The Court concludes that: (i) DeLeon's disclosure meets rule 16(b)(1)(C)'s requirements, because it was timely and offers an appropriate summary of Dr. Spence's proposed testimony; (ii) DeLeon demonstrates that Dr. Spence applied reliably industry-accepted principles when analyzing Radecki and Tokumaru's analyses; and (iii) Dr. Spence (a) may testify about the risk of cross-contamination generally, and about the procedures the Crime Lab followed when testing evidence recovered from the scene of the alleged murder of Frank Castillo in March, 2001, and whether those procedures could have allowed for DNA cross-contamination, (b) may not testify about the procedures the Crime Lab did or did not follow -- or the likelihood of cross-contamination -- if, to form an opinion, Dr. Spence must speculate about what the Crime Lab did, and (c) may not testify that the reanalysis of the collected DNA samples by Tokumaru, the author of the 2014 report, demonstrates that the detection of DeLeon's DNA on the murder weapon is not scientifically reproducible. The Court, therefore, will grant the Motion in part and deny the Motion in part.

FACTUAL BACKGROUND

The Court takes its background facts from the Second Superseding Indictment, filed March

9, 2017 (Doc. 947)("Indictment"). The background facts largely are unchanged from those facts that the Court provides in its Memorandum Opinion and Order, 423 F. Supp. 3d 1210, filed November 19, 2019 (Doc. 1585). The Court does not set forth these facts as findings or the truth. The Court recognizes that the factual background largely reflects the United States' version of events and that the Defendants are all presumed innocent. The Court takes the particular facts relevant to this case largely from the Defendant's Notice of Expert Witness Testimony, filed December 21, 2020 (Doc. 3220)("Notice"), and the attached documents.

1. Background Facts.

This case deals with crimes that SNM allegedly committed through its members. See Indictment at 2. SNM, through its members, operates in the District of New Mexico, and its members engage in acts of violence and other criminal activities, "including murder, kidnapping, attempted murder, conspiracy to manufacture/distribute narcotics, and firearms trafficking." Indictment at 2. The SNM constitutes an enterprise "as defined in Title 18, United States Code, Section 1959(b)(2), that is, a group of individuals associated in fact that engaged in, and the activities of which affected, interstate and foreign commerce." Indictment at 2-3.

The SNM is a prison gang formed in the early 1980s at the Penitentiary of New Mexico ("PNM") after a violent prison riot at PNM during which inmates assaulted and raped twelve correctional officers after taking them hostage. Indictment at 3. During the riot, thirty-three inmates were killed, and over 200 inmates were injured. See Indictment at 3. After the PNM riot, SNM expanded throughout the state's prison system and has had as many as 500 members. See Indictment at 3. SNM now has approximately 250 members, including "a 'panel' or 'mesa' (Spanish for table) of leaders who issue orders to subordinate gang members." Indictment at 3. SNM controls drug distribution and other illegal activities within the New Mexico penal system,

but it also conveys orders to members outside the prison system. See Indictment at 3. Members who rejoin their communities after completing their sentences are expected to further the gang's goals: primarily the control and profit of narcotics trafficking. See Indictment at 3-4. Members who fail "to show continued loyalty to the gang [are] disciplined in various ways, [] includ[ing] murder and assaults." Indictment at 4.

SNM also intimidates and influences smaller New Mexico Hispanic gangs to expand its power. See Indictment at 4. If another gang does not follow SNM's demands, SNM will assault or kill one of the other gang's members to show its power. See Indictment at 4. SNM's rivalry with other gangs also manifests in beatings and stabbings within the prison system. See Indictment at 4. SNM engages in violence "to assert its gang identity, to claim or protect its territory, to challenge or respond to challenges, to retaliate against a rival gang or member, [and] to gain notoriety and show its superiority over others." Indictment at 4. To show its strength and influence, SNM expects its members to confront and attack any suspected law enforcement informants, cooperating witnesses, homosexuals, or sex offenders. See Indictment at 5. To achieve its purpose of preserving its power, SNM uses intimidation, violence, threats of violence, assaults, and murder. See Indictment at 7. SNM generates income by having its members and associates traffic drugs and extort narcotic traffickers. See Indictment at 8. SNM members' recent conspiracy to murder high-ranking New Mexico Corrections Department ("NM Corrections Department") Officials inspired the Federal Bureau of Investigation's present investigation. See United States v. Garcia, No. CR 15-4275, Memorandum Opinion and Order at 2, 221 F. Supp. 3d 1275, 1277, filed November 16, 2016 (Doc. 133).

2. Particular Facts: The Crime Lab's Tests.

On or about March 26, 2001, Frank Castillo allegedly was murdered in at Southern New

Mexico Correctional Facility near Las Cruces, New Mexico. Indictment at 9. See Dr. Spence Report: U.S.A. v. Angel Jose DeLeon at 1, filed December 21, 2020 (Doc. 3220-2)("Spence Report"). In the Indictment, the United States alleges that DeLeon, along with Defendants Joe Lawrence Gallegos, Edward Troup, a.k.a. "Huero Troup," Leonard Lujan, and Billy Garcia, a.k.a. "Wild Bill," murdered Frank Castillo. so they could "gain[] entrance to and maintain[] and increase[] position" in SNM. Indictment at 9. Castillo was killed by strangulation. See Spence Report at 1. Investigators recovered a series of items from the crime scene, including a white t-shirt, a white sock, a calf-high white athletic sock, a gray, long-sleeve thermal shirt, a second white t-shirt, a third white t-shirt, a pair of green pants, a pair of black athletic socks, a gray sweatshirt, and a knotted white shoelace or cord. See Spence Report at 5-12. The knotted white cord is the suspected murder weapon. See Spence Report at 1. The Crime Lab wrote and issued two reports on this evidence. See Spence Report at 1. Kristin Radecki wrote the first report, and it was released on May 23, 2001. See Spence Report at 1. Eve Tokumaru wrote the second report, which was released on June 28, 2014. See Spence Report at 1.

The first report, Radecki's, compared the DNA found on the knotted white cord -- the murder weapon -- to the DNA found on one of the white t-shirts and a white sock, both of which belonged to DeLeon. See Spence Report at 1. There were blood stains on both the t-shirt and the white sock. See Spence Report at 1. On May 4, 2001, Radecki compared DeLeon's blood and Castillo's blood with the blood stains on the two items of clothing. See Spence Report at 1. In the 2001 report, Radecki concluded that the stains were from DeLeon's blood. See Spence Report at 1. Four days later, on May 8, 2001, Radecki then sampled six areas from the knotted white cord, and was not able to say that the DNA found did not belong to Frank Castillo or to DeLeon. See Spence Report at 1. On May 10, 2021, Radecki loaded various DNA samples into a "96-well

amplification plate," a plastic plate with 96 indented wells arranged in an eight-by-twelve grid pattern. Spence Report at 2. An amplification plate like the one Radecki used is about the size of a wallet. See Spence Report at 15. Radecki loaded samples from DeLeon's bloodstains into wells A5, A7, and A9 -- as labeled on the amplification plate -- then loaded samples from the knotted white cord into wells C9, C11, E1, E3, E5, and E7. See Spence Report at 2. According to Dr. Spence, "[w]ithin each well on an amplification plate, many millions of pieces of DNA will be manufactured over the course of just a few hours" and "provide the foundation for human identification in all crime labs." Spence Report at 2. According to Dr. Spence, after conducting the amplification procedure of samples from DeLeon's clothing and the murder weapon on the same amplification plate, Radecki compared the DNA and concluded that the samples from the knotted white cord, the murder weapon, were "'indistinguishable,'" suggesting "consistency with Mr. Castillo, as well as Mr. DeLeon." Spence Report at 3 (no citation for quotation).

The second report was released thirteen years later. See Spence Report at 3. Eve Tokumaru re-analyzed four samples from the knotted white cord. See Spence Report at 3. According to Dr. Spence, this second, 2014 analysis "***failed*** to reproduce a single DNA mixture that may have hinted at the inclusion of Angel DeLeon." Spence Report at 3 (emphasis in Spence Report). Specifically, Tokumaru found 136 picograms (pg)[1] of DNA on the knotted white cord, which is "equal to the expected amount of DNA from only 22-23 cells." Spence Report at 3. According to Dr. Spence, Tokumaru found a match between the DNA on the knotted white cord and DeLeon's DNA at only one of the knotted white cord's six sampled areas, which was "considered unreliable for any comparative interpretations." Spence Report at 3. Tokumaru also re-analyzed DNA from a piece of string that had been tied to the knotted white cord. See Spence Report at 11. Tokumaru

[1]One gram is equal to 1,000,000,000,000 picograms.

recovered 390pg of DNA from the string. See Spence Report at 3. Tokumaru found a "partial DNA profile" at six of the fifteen areas of the string that she tested, and Castillo could not be excluded as a possible match, but DeLeon could be excluded. Spence Report at 3. Next, Tokumaru was able to recover 605pg of DNA from the inside of a hat that had been collected from the alleged murder scene. See Spence Report at 3. Here, Tokumaru again observed a "partial DNA profile" at six of the sampled locations on the hat, [2] but Tokumaru was able to exclude DeLeon as a possible contributor. See Spence Report at 3. Last, Tokumaru recovered 72.5ng of DNA from a stain on an unknown item.[3] See Spence Report at 3. Tokumaru found a "single-source match" to Castillo. Spence Report at 3. Tokumaru was able to exclude DeLeon as a match to the DNA sample found in the stain on the unknown item. Spence Report at 3.

PROCEDURAL BACKGROUND

This case includes the remaining Defendant in the Indictment. See Indictment at 1. This case is set for trial on September 7, 2021. See Proposed Amended Scheduling Order, filed July 12, 2021 (Doc. 3304). This Motion comes before the Court as the parties prepare for trial.

1. DeLeon's Notice of Expert Witness Testimony.

On December 21, 2020, DeLeon, pursuant to rule 16(b)(1)(C) of the Federal Rules of Criminal Procedure, alerted the Court of his intent to call Dr. Spence at trial to testify that the simultaneous "processing of Mr. DeLeon's blood t-shirt samples in May of 2001" and the "samples from the murder weapon in this case" is "problematic," because it could have allowed for "cross-contamination." Notice at 2. Dr. Spence is a forensic biologist who has "been qualified as an

[2]The Spence Report does not state how many locations on the hat Tokumaru or Radecki sampled. See Spence Report at 1-73.

[3]Neither the Spence Report nor the attached pages of the Crime Lab reports indicate where this stain is. See Spence Report at 1-73.

expert in DNA in over 125 trials and provided testimony both for the prosecution and defense." Notice at 1. DeLeon argues that Dr. Spence is "crucial" to his defense, because Dr. Spence can "explain the presence of Mr. DeLeon's DNA on the murder weapon." Notice at 2.

DeLeon contends that Dr. Spence is qualified, so the Court should, pursuant to Kumho Tire Co., Ldt. V. Carmichael, 526 U.S. 137 (1999), permit Dr. Spence to testify. Notice at 2. In particular, DeLeon argues that Dr. Spence's proposed testimony "has 'a reliable basis in the knowledge and experience of the [relevant] discipline.'" Notice at 3 (quoting United States v. Velarde, 214 F.3d 1204, 1208-09 (10th Cir. 2000)).

2. The United States' Motion to Exclude or Hold a Daubert Hearing.

The United States asks the Court either to exclude Dr. Spence's testimony or, in the alternative, to hold a Daubert hearing to "determine whether the jury should be permitted to hear Dr. Spence's opinions." Motion at 1. See Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993)("Daubert"). The United States advances three arguments: (i) DeLeon's expert disclosure does not meet rule 16's requirements; (ii) DeLeon does not demonstrate that Dr. Spence reliably applied relevant scientific principles to the case's facts; (iii) if the Court allows Dr. Spence to testify about DNA cross-contamination, it should bar Dr. Spence from testifying about the likelihood of cross-contamination. See Motion at 2-5. Generally, the United States asks that the Court "thoroughly address[]" "[t]hese issues" before trial "in order to prevent the introduction of inadmissible evidence and blatant surmise, rather than reasoned opinions by qualified experts." Motion at 6.

First, the United States contends that DeLeon "has not provided an adequate explanation of the opinions or the bases and reasons for the opinions that Dr. Spence intends to express," as rule 16 requires. Motion at 3. The United States finds it "unclear" "what laboratory experiments,

if any, Dr. Spence has performed in this case, other than reviewing the paper discovery provided by the United States." Motion at 3. Further, the United States alleges that, based on Dr. Spence's curriculum vitae, it is "unclear . . . what kind of education, training, and professional experience he has in the field of DNA cross-contamination." Motion at 3. Because, according to the United States, Dr. Spence "does not currently have a laboratory and only performs consultation work," DeLeon fails to provide "basic and elementary information regarding Dr. Spence's expertise as it relates to his proposed expert testimony." Motion at 3.

Second, the United States argues that the Court should bar Dr. Spence's testimony, because DeLeon does not demonstrate that Dr. Spence applied reliably the principles and methods of DNA cross-contamination to the facts of this case. See Motion at 3. The United States notes that rule 702 imposes a "'gatekeeper obligation' to ensure that the proposed expert testimony 'is not only relevant, but reliable.'" Motion at 4 (quoting Dodge v. Cotter Corp., 328 F.3d 1212, 1221 (10th Cir. 2003)). Although the United States "does not challenge Dr. Spence's qualifications," the United States disputes that Dr. Spence's "proffered opinion is reliable for the simple reason that his report is apparently based solely on his review of discovery provided by the United States and not any independent laboratory testing." Motion at 4. The United States alleges that Dr. Spence's report is "rife" with "conclusory assertations based on nothing more than pure speculation." Motion at 4. As a result, the United States suggests that the Court "cannot test, consistent with its gatekeeper function," whether Dr. Spence "reliably applied the methods of DNA cross-contamination to the facts of this case." Motion at 4.

Third, the United States argues that, even if the Court allows Dr. Spence to testify about DNA cross-contamination, the Court should bar him from testifying about the likelihood of cross-contamination. See Motion at 5. According to the United States, Dr. Spence "does not typically

and has not independently tested the DNA evidence in this case," so his opinion is "speculative." Motion at 5. Specifically, the United States stresses that, because now-Chief Judge Johnson barred Dr. Spence from testifying under similar circumstances, the Court should bar him here. See Motion at 5 (citing United States v. Sedillo, No. CR 10-2085 WJ, 2011 WL 13286206 (D.N.M. Jan. 18, 2011)(Johnson, J.)). Finally, the United States "requests" that DeLeon "not be permitted to discuss as facts, in voir dire or opening statement, what Dr. Spence may state about his proposed opinions, if these assumptions are not based on admissible evidence, until those facts have been established in court." Motion at 6.

3. DeLeon's Response.

DeLeon responds to the Motion. See Defendant's Angel DeLeon's Response to Government's Motion to Exclude Expert Witness or in the Alternative Hold a Daubert Hearing, filed July 13, 2021 (Doc. 3305)("Response"). In the Response, DeLeon argues that the United States is not entitled to a Daubert hearing, because the Court can perform its gatekeeping function without a hearing. See Response at 1. In addition, DeLeon advances two arguments: (i) the Notice satisfies rule 16; and (ii) a Daubert hearing is not necessary. See Response at 1-2.

First, DeLeon contends that the Notice satisfies rule 16, because it provides a "summary of Dr. Spence's testimony and his qualifications and a 73-page report." Response at 1. DeLeon argues that it is "common practice" for an expert only to review, rather than reproduce, the government experts' work. Response at 2. According to DeLeon, Dr. Spence "need not conduct experiments himself." Response at 2. Further, DeLeon argues that both Dr. Spence's report and his curriculum vitae "clearly address [his] experience in cross-contamination." Response at 2. Specifically, DeLeon contends that Dr. Spence's experience is sufficient, and his analysis of the DNA "'amplification'" procedures and the possibility of cross-contamination meets the rule 702

threshold. Generally, DeLeon contends that the United States' concerns are "proper for cross-examination and an argument towards weight of the evidence," and not its admissibility. Response at 2.

Second, DeLeon argues that a Daubert hearing is unnecessary, because the United States can cross-examine Dr. Spence at trial, and its arguments are better aimed at a jury. See Response at 4. DeLeon notes that the United States Court of Appeals for the Tenth Circuit does not always require a Daubert hearing. See Response at 3 (citing United States v. Turner, 285 F.3d 090, 913 (10th Cir. 2002)). DeLeon discusses United States v. Nichols, 169 F.3d 1255 (10th Cir. 1999), and contends that, because the Tenth Circuit, in United States v. Nichols, held that the district court did not abuse its discretion when it chose not to hold a United States v. Daubert hearing, because "a separate, pretrial hearing is not required in order for a district court to properly fulfill its gatekeeping function," a Daubert hearing is also not required here. Response at 3.

4. The Hearing.

The Court held a hearing on August 2, 2021. See Clerk's Minutes at 1, filed August 2, 2021 (Doc. 3408). The hearing began with the Court saying that, having reviewed the materials, it was "uncomfortable with Dr. Spence coming in and then going the step further and saying here's what the result [of the DNA analysis] would have been, or here is what it would or would not have said." Draft Transcript of August 2, 2021, Hearing at 3:4-7 (taken August 2, 2021)(Court)("Tr.").[4] The Court stated that it "seems like [Dr. Spence] is qualified," so he can testify "here's what you do, looking at the record, there are certain things he didn't do," but Dr. Spence cannot "do the additional step of going further and saying what the test results would be." Tr. at 3:12-17 (Court).

[4]The Court's citations to the hearing's transcript refer to the court reporter's original, unedited version. Any final transcript may contain slightly different page and/or line numbers.

The United States responded: "I think I agree, Your Honor, I think we're close on some things." Tr. at 3:18-20 (Castellano). The United States agreed with the Court that Dr. Spence should not be able to state that something "could lead to cross-contamination, but that doesn't really tell the jury much because any subject case is subject to potential cross-contamination." Tr. at 3:23-4:1 (Castellano). The United States indicated that it prefers if the attorneys "fill in the blank in closing." Tr. at 4:8 (Castellano). Specifically, the United States explained that it was "concerned" about some statements in the Spence Report that suggest the DNA tests are done with "no appropriate sense of caution," because Dr. Spence "wasn't there so he can't really say whether there is an appropriate sense of caution." Tr. at 4:23-5:1 (Castellano).

DeLeon argued that the Court should allow Dr. Spence to testify about "based on his training and experience . . . what conditions can lead to cross-contamination." Tr. at 6:10-12 (Gorman). DeLeon contended that the Court should allow Dr. Spence to explain that, "according to those types of norms and procedures from what he was able to review in these reports, this report from Ms. [Radecki] in 2001[,] . . . those norms did not appear to be followed." Tr. at 7:1-4 (Gorman). The Court proposed that Dr. Spence be allowed to testify "what he [thinks] needs to have been done. He says on the basis of my review of the record I don't see that one, two, three being done. And if in fact those things are not done this test is not, would not in my opinion be reliable." Tr. at 7:10-14 (Court). The Court noted that "the record is kind of thin, I mean some of it we don't know whether it was done or not done, but he could say if it's not done and he doesn't see if from the record then that would not make a reliable test." Tr. at 7:17-21 (Gorman). DeLeon responded by suggesting that "it's not just things that weren't done it's things that were done but improperly." Tr. at 7:22-24 (Gorman). The Court acknowledged "[t]hat's true," and explained that "I'm not trying to cut those out I'm trying to figure out if we can script out what he says." Tr.

at 7:25-8:1-2 (Court).

DeLeon contended that, for example, the Spence Report explains that it "was fundamentally flawed to handle [apparently]] DNA rich source of blood from an accused individual prior to handling small quantities of DNA that can be expected on the surface of familiar murder weapon," so "I'd want him to say that based on his expertise and in the field to handle that DNA rich source." Tr. at 8:7-14 (Gorman). The Court asked "how does he say that? What is it about the record that allows him to say that." Tr. at 9:2-4 (Court). The Court explained that it was "a little uncomfortable" in giving Dr. Spence leeway to make assertions or opinions about Radecki and Tokumaru's tests that the record does not clearly support. Tr. at 9:15-16 (Court).

To settle the confusion, the parties agree to put Dr. Spence on the stand to see "how he concludes what he concludes, and . . . whether or not he can truly make these statements." Tr. at 9:25-10:2 (Castllano). DeLeon noted that the Court should allow Dr. Spence to say Radecki and Tokumaru's tests were done with "no appropriate sense of caution," Tr. at 11:12 (Gorman), and that "we can have Dr. Spence speak as to why he wrote that," Tr. at 12:16-17 (Gorman). DeLeon argued that the jury should hear that "when Dr. Spence talks about handling the two DNA rich sources together, when he talked about that there are two equally plausible possibilities for why Mr. DeLeon's DNA could have been on this ligature, and . . . his opinions about the amplification plates and the air." Tr. at 12:2-8 (Gorman).

Dr. Spence then took the stand and was sworn. See Tr. at 14:2-5 (Clerk, Spence). Dr. Spence recounted his education and professional experience, which includes a PhD in molecular biology from New Mexico State University, see Tr. at 15:3-4 (Spence), postdoctoral fellowships, and time as a laboratory technician with the Indiana State Police, see Tr. at 16:5-23 (Spence). After

four years with the Indiana State Police doing serology and evidence analysis, see Tr. at 17:4-25 (Spence), Dr. Spence found a position at a private laboratory on the New Mexico State University campus that did genetic testing, see Tr. at 19:6-10 (Spence). In February 2008, Dr. Spence resigned his position and started a company -- Spence Forensic Resources -- and has since been working as a consultant. See Tr. at 19:20-23 (Spence). Dr. Spence explained that working as a DNA consultant involves looking

> through all the case documents and the police reports to bring all that together and they want attorneys or more of happens to be calling about the case to explain to them the technology that went into it, what the results are and any issues there might be with how the work was done.

Tr. at 20:5-1 (Spence). When asked if he does any testing himself, Dr. Spence responded: "No, I don't have a laboratory to do any testing." Tr. at 20:13-14 (Spence). Dr. Spence stated that, since he left the forensic lab in February, 2008, his job became "completely document review and review of what was going on with each case and the specific documents within there." Tr. at 21:1-3 (Spence). Dr. Spence explained that

> what I typically do is get all the discovery . . . and then a lot more scientific information [and] . . . any reports that were released and what I call the supporting documents, so that's all of the descriptive documents and worksheets that the analyst . . . [generates, which] describe how they broke down each evidence item, what they did, when they did it, what kind of tests they ran, the DNA extractions, quantifying the DNA and how much they got from each sample and what [their] typing results were, all the way through to the end . . . .

Tr. at 21:3-15 (Spence). Dr. Spence summarized: "[S]o what I do as a consultant now is I review all of that and I provide a report if I'm asked to do that." Tr. at 21:15-17 (Spence).

Dr. Spence explained that he stays up-to-date on forensic DNA research by reading cases from similar laboratories across the country, see Tr. at 21:24-25 (Spence), reading the laboratories' "quality assurance documents that they adhere to," Tr. at 22:4 (Spence), reviewing the "peer reviewed scientific papers [that] are out there," Tr. at 22:9 (Spence), and reviewing webinars,

"especially during the pandemic," which cover the "cutting [edge] of changes that are happening in forensic biology and DNA," Tr. at 22:15-19 (Spence). Dr. Spence noted that he has given presentations "to help others get training in what's going [on]" in forensic biology and DNA, Tr. at 23:5-7 (Spence), and has published twenty-seven chapters on areas relating to medicine, psychology, and forensic DNA, see Tr. at 24:1-5 (Spence).

The conversation then turned to Dr. Spence's involvement in this case. See Tr. at 41:23 (Spence). Dr. Spence explained that he was first contacted on October 16, 2019, to review the DNA evidence reports relating to DeLeon. See Tr. at 25:1-4 (Spence). From the 2001 report, Dr. Spence said that he "looked at all the information on how the DNA was extracted, when it was extracted, quantification of all the DNA sources and the evidence and the reference samples and ultimately once the typing was done the comparisons between the known reference samples and the evidence samples." Tr. at 26:4-9 (Spence). Dr. Spence said that, from the 2014 report, he reviewed "similar things," but noted that there was "really no return back to the serology of it," so the new analyst

> that came in over 13 years later just went back to that original OMI 2 sample and did a recollection of some material from what we call the murder weapon and then did DNA extractions from four different areas of those items and then did the same thing, extraction of DNA, the capital case indication of what's on each item and then ultimately getting the DNA typing and comparing that back to the reference samples that were available.

Tr. at 26:14-22 (Spence).

Dr. Spence stated that he prepared the Spence Report based on his analysis of the 2001 report and the 2014 report, and released it on December 21, 2020. See Tr. at 26:23-25 (Spence). According to Dr. Spence, reviewing other technicians' work is "typical[]," because he is able to "look at the work of other DNA technicians and form opinions based on their practices and procedures." Tr. at 28:1-7 (Spence, Gorman). DeLeon's attorney then asked Dr. Spence to

summarize some of the Spence Report's conclusions. See Tr. at 26:23-25 (Spence). With respect to Radecki's 2001 report, Dr. Spence stated that the order and timing of her analysis is "fundamentally flawed." Tr. at 29:17 (Spence). Although Dr. Spence acknowledged that "it's impossible to be absolutely certain how something was done," Tr. at 30:5-6 (Spence), but that he could figure out how Radecki handled evidence from her own notes, Tr. at 30:23-31-1 (Gorman, Spence). Specifically, Dr. Spence stated that there "is a problem" with analyzing first an item known to belong to DeLeon, and then the murder weapon, because "you can't just assume that the blood is going to be from somebody other than Mr. DeLeon and at this time might be or is from the victim." Tr. at 31:17-22 (Spence). Dr. Spence then alleged, "[t]hat could go wrong and it kind of did." Tr. at 32:1 (Spence).

To explain why "you would not handle that DNA rich source from the blood of a t-shirt of Mr. DeLeon next to this murder weapon," Tr. at 32:12-14 (Gorman), Dr. Spence noted that he was "relying on the standards that were produced by the FBI in 2011 and genes that were produced by an organization called the Scientific Working Group for DNA Analysis Methods," known colloquially as "SWGDAM." Tr. at 32:17-22 (Spence). SWGDAM is a group of "experts in how things should properly be done," Tr. at 32:22-23 (Spence), that create "quality assurance manuals for a lot of different labs," Tr. at 33:15-16 (Spence). Dr. Spence asserts that "you can see it in [SWGDAM's] documentation their standards and guidelines that you don't want to be handling any kind of DNA from an accused person first." Tr. at 32:25-33:2 (Spence). The risk is that "you can carry forwards DNA onto the subsequent samples, so it's about, especially if you don't know who is on the first set of items you just know it's going to be a rich source, perhaps separate those out and test those later." Tr. at 33:6-10 (Spence).

Dr. Spence then turned to his critique of Radecki's 2001 report, and asserted that the first

problem comes from page 17 of the report, where Radecki details using a 95-well amplification plate,[5] which is "about . . . the size of . . . a wallet." Tr. at 35:14 (Spence). Normally, "you want to put your DNA in the specific wells[6] and the analyst of course wants to keep track of which wells they put it in." Tr. at 35:24-36:1 (Spence). Second, Dr. Spence alleged that Radecki also erred by "running those high copy samples just four days prior to going to the low copy murder weapon samples." Tr. at 36:15-17 (Spence). Otherwise, although "it's difficult within her notes to discern whether they're swabbings or whether there are cuttings or whether there is a little bit done of both or what this [cord][7] looked like when she first started and what it looked like when she was done with it," Dr. Spence thought Radecki's other procedures "were all just fine" -- with the exception, of course, of what the "[potentially] disastrous problem here on the amplification [plate]." Tr. at 36:2-37:3 (Spence).

According to Dr. Spence, there is no field of cross-contamination within the field of DNA research; rather, "the cross-contamination issue or various types of contamination is part landscape but it's really . . . a problem that's in the field is that you're going to sometimes get contamination issues." Tr. at 37:10-14 (Spence). According to Dr. Spence, "[r]eally the most catastrophic danger we have is avoiding contamination problems." Tr. at 38:1-2 (Spence). Dr. Spence explained that he has been trained to avoid cross-contamination and that he has written about this issue. See Tr. at 38:7-40:19 (Spence). Dr. Spence stated that "aerosols" can create cross-contamination problems, because pipetting DNA-infused solutions into an amplification plate can create a faint

[5]An amplification plate is a small, plastic tool used in DNA amplification.

[6]Each amplification plate is marked by numerous "wells," which are small indentations that hold liquid.

[7]The cord was one of the items collected from the crime scene and tested. See Spence Report at 5-12.

aerosol of solution, and "if you set that [plate] . . . down too hard on the bench . . . [makes a little] bit of turbulence [which] can create aerosols and . . . those aerosols can go God knows where." Tr. at 41:12-22 (Spence). According to Dr. Spence, it's "highly unlikely that [the person performing the analysis would] ever see that happening." Tr. at 43:18-19 (Spence). Dr. Spence state that, while "all the labs" have some quality controls, the goal is to minimize "contamination and that's what the entire [SWGDAM] guidelines from January of 2017 focus on is first of all prevention of contamination, but also detention of the contamination if it should so happen." Tr. at 47:6-21 (Spence). Dr. Spence stated that he has reviewed "quite a few cases" from other New Mexico Department of Public Safety crime laboratories, and that are "very proactive about identifying problems they have." Tr. at 48:12-15 (Spence).

The hearing then turned briefly to Tokumaru's 2014 analysis. See Tr. at 49:7-10 (Gorman). Dr. Spence stated that, when Tokumaru did her work, "she found no indication of Mr. DeLeon on the samples that she looked at. The results were not reproduc[able]." Tr. at 49:18-20 (Spence). Last, Dr. Spence explained that he has testified previously in federal court in United States v. Sedillo, "where there was an issue of DNA there." Tr. at 49:25 (Gorman). According to Dr. Spence, the issue here is "quite different," because

> in this case we're talking about handling, setting up extraction and . . . amp plates that's . . . [a] completely different context than what we're talking about with transfer and cases which the DNA transfer does happen out there in the real world[;] it can happen in our homes in our cars in our workplace and so forth.

Tr. at 50:3-14 (Spence).

DeLeon's attorney then asked Dr. Spence to clarify what he means in his report by "there being no apparent sense of caution used." Tr. at 50:21-22 (Gorman). Dr. Spence stated that "maybe I shouldn't say no appropriate sense of caution, I think it would be a terrible sense of caution to just put all the samples in the same well that would be horrible" and "putting them in

the [w]ells in this fashion is an unnecessary, unfortunate risk of cross-contamination." Tr. at 51:16-18 (Spence). Further, Dr. Spence stated that he has "no way of diagnosing whether there was a contamination event caused by the risks that were taken here, or that there wasn't a contamination event," and that he "can't even calculate any kind of statistical probability of either, only that this violates the standards of guidelines." Tr. at 52:15-20 (Spence).

The United States' attorney then began to question Dr. Spence. See Tr. at 53:1 (Castellano). Dr. Spence stated that there "is no doubt" that DeLeon's DNA was on the murder weapon, but that his testimony is "really focused on the potential for cross-contamination." Tr. at 53:8-10 (Spence, Castellano). When the United States' attorney asked Dr. Spence, "there will be no testimony about DNA transfer; is that correct?" Dr. Spence stated that he "wouldn't be certain of that," because there is "always potential," and that there are "two possibilities, one is that the DNA was truly there on that item when it came into the lab, the second being that it could have been a cross contamination event." Tr. at 53:17-23 (Castellano, Spence). The United States' attorney asked Dr. Spence to clarify what he meant when he states that no analyst would "do that." Tr. at 54:3 (Castellano). In response, Dr. Spence stated that "there was no appropriate sense of caution," but he "immediately explain[ed] that by pointing out which wells were used for the . . . blood copy samples and which wells were load[ed] up with murder [weapon] samples," and that "no analyst would pick for example . . . well A5 and put all of those in the same well[;] that would be absolutely no sense of caution at all." Tr. at 54:5-12 (Spence). It is "inappropriate to load high copy evidence on the same [plate as the] low copy evidence," according to Dr. Spence, Tr. at 54:15-16 (Spence), and "that's what Ms. [Radecki] did in this case," Tr. at 54:17-18 (Castellano). When asked, Dr. Spence acknowledged that there was no "indication about anybody complaining about" Radecki. Tr. at 54:24-25 (Castellano).

The United States' attorney then asked Dr. Spence about the procedures that Radecki followed in her analysis. See Tr. at 55:6 (Castellano). Dr. Spence said: "I believe she used heart tips[8] [on the pipette] if she didn't use heart tips then that brings a whole new layer of issues." Tr. at 56:4-6 (Spence). Dr. Spence also stated that he knows only where Radecki put samples on the amplification plate, not whether she "shook," if "she smacked it down hard," or "precisely the order that she loaded all the samples." Tr. at 56:10-22 (Spence). The United States' attorney asked Dr. Spence if "the best [you can do] is say this process creates . . . the potential for cross-contamination?" Tr. at 56:23-25 (Castellano), and Dr. Spence responded, "Correct," Tr. at 57:1 (Spence). Further, Dr. Spence stated that, typically, if there is a risk of cross-contamination in a lab, the lab reports it, but that he does not know if the lab reported such an indication here. See Tr. at 57:10-24 (Spence).

The testimony then turned to the conclusions Dr. Spence drew in the Spence Report. See Tr. at 58:12-21 (Castellano). The United States' attorney asked Dr. Spence to explain why he concludes that Radecki handled a DNA-rich source of blood from an accused individual before handling the murder weapon. See Tr. at 58:12-21 (Castellano). Dr. Spence said that it "would not be in the report, that would be in those note sheets and the dates on those note sheets." Tr. at 59:1-2 (Spence). Dr. Spence also noted that, with respect to items G5 and G6, it's "not a matter of how she handled them but when she handled them." Tr. at 59:16-17 (Spence). According to Dr. Spence, there is "blood on the shirt" and "blood on the sock," and were handled on May 4, 2001 and "four days later the murder weapon sample . . . [was] handled on May 8. So that's four days later." Tr. at 59:19-24 (Spence). Between May 4, 2001, and May 8, 2001, Dr. Spence noted, the

[8]Various tips are available for pipettes "to speed processing and reduce cross-contamination." Pipette Tips, Pipette.com, https://www.pipette.com/pipette-tips (last visited September 14, 2021).

analyst could have been "swabbing down all the benches with disinfectant and changing all their gloves," but there it "at least potential that some of the DNA might be around the lab. Could it be on a refrigerator door handle could it be on a bench top." Tr. at 60:24-61:11 (Spence). Dr. Spence noted again that he does not "have a record of exactly how they were handled" or "what parts of [the] lab were used," because he was "in another state at the time and was not watching [Radecki] as she did this." Tr. at 61:19-22 (Spence). Moreover, Dr. Spence stated -- with respect to "space" -- that he "can't tell you exactly where those were handled[.] I can't tell you where they were transported to, the different parts of the lab, what gloves were used or anything else about what [Radecki] did at the time." Tr. at 62:7-13 (Spence). Dr. Spence stated, however, that he was "not speculating at all," because it would be a "violation of standards and procedures to handle references first and type those on May fourth and then type the evidence for low copy evidence four days later." Tr. at 62:15-23 (Spence). Although "that's not what [Radecki] did," Tr. at 62:24 (Spence), Dr. Spence stated that:

> in a way she kind of did because these blood samples that are on his shirt [and] appeared [on] his sock are a de facto reference sample they're going to behave just like a reference sample in that Number 1 they're very rich and number [two] they should be a pure profile of him and they were.

Tr. at 62:24-63:4 (Spence).

The United States' attorney then began to ask Dr. Spence about his comment regarding "no appropriate sense of caution." Tr. at 63:5-6 (Spence). The United States' attorney stated "that's a pretty strongly worded statement" and that Dr. Spence is basing his conclusions "on the way that these items were place on the amplification [plate]." Tr. at 63:6-10 (Spence). Dr. Spence responded that he was "basing it on the fact that this violat[es] the standards and . . . guidelines from the FBI and [SWGDAM]." Tr. at 63:11-13 (Spence). Dr. Spence explained that he chose the word "catastrophic," because it is "undetectable," and that there is "no way of knowing" there

could have been cross-contamination, because it "goes from a high copy blood sample from the shirt" onto the murder weapon, which would be "interpreted as his DNA being [on] the murder weapon and that's game set match that's just it." Tr. at 63:24-64:5 (Spence). The United States' attorney asked if Dr. Spence could clarify, because "you don't know that this [is] catastrophic it's just a potential for a catastrophic result?" Tr. at 64:11-13 (Castellano). Dr. Spence responded that "you can't put them on the same [plate]" and that's what SWGDAM says. Tr. at 64:15-16 (Spence). Further, Dr. Spence stated that "[a]nytime that you risk a risk of . . . cross-contamination that could make it look like . . . the evidence is an accused person when that wasn't the case when it came to the lab," that he would conclude that it is "a catastrophic, that's catastrophic contamination event." Tr. at 66:2-6 (Spence).

The United States' attorney then asked Dr. Spence what he meant when he said that the handling of the sock and the shirt "could go wrong and it did." Tr. at 66:14 (Castellano). Dr. Spence explained that he meant "that it could be Mr. DeLeon's . . . and in that case, then you're loading up a DNA rich sample from his blood right next [to] the same amplification [plate] as the low copy evidence from the murder weapon." Tr. at 66:16-21 (Spence). Dr. Spence clarified: "When I say it did go wrong it doesn't mean that it did go wrong." Tr. at 68:4-5 (Spence). Rather, it "did go wrong" in the sense that

> if the analyst was perhaps hoping that . . . the victim's blood on there which would [have] been very important to discover that. But the analyst couldn't assume that because just for example, I do a lot of work in the . . . cut myself and get blood on my own shirt so it might have been a good assumption that that might be [Mr. DeLeon's] blood. The analyst didn't worry about that. [Radecki] [l]oaded the high copy blood samples on the same [plate] with the murder weapon and this was a really bad idea.

Tr. at 68:7-17 (Spence). When the United States' attorney suggested that Dr. Spence was "speculating by saying [what the] analyst didn't worry about," Dr. Spence countered that "it's a

big problem when the DNA turns out to be blood from the defendant, especially considering that the analyst didn't take the step to separate potential blood from the defendant from the murder weapon." Tr. at 69:8-12 (Spence). When the United States' attorney pressed Dr. Spence by asking, "[o]nce again you said it's a big problem. But it's not . . . a big potential problem?" Tr. at 69:15-17 (Spence), Dr. Spence maintained that it "turned out to be a big problem, because there was no separation of a DNA rich sample according to [SWGDAM] 2.1.2 guidelines," Tr. at 69:18-20 (Spence). Dr. Spence asserted: "I know it was 16 years before [SWGDAM] came out, but [Radecki] should have intuitively realized that it would be better to take samples of that shirt and the type them . . . not [at] the same time on the same [plate]." Tr. at 69:24-70:4 (Spence).

After briefly discussing Dr. Spence's difficultly with cross-contamination in some of his unrelated work, see Tr. at 70:25-71:21 (Castellano, Spence), the conversation returned to Dr. Spence's credentials, see Tr. at 71:22 (Castellano). The United States' attorney noted that Dr. Spence has reviewed "over 975 cases [for] both prosecution and the defense in criminal cases," Tr. at 71:22-25 (Castellano), but Dr. Spence said that the number is "higher now," Tr. at 72:2 (Spence). The last time that Dr. Spence worked for the prosecution was in 2007, which was also the last time that he worked at an accredited laboratory. See Tr. at 72:3-11 (Castellano, Spence). Dr. Spence also stated that he has not published a peer-reviewed article since 2003. See Tr. at 71:01 (Spence).

The United States' attorney continued by asking Dr. Spence if he was "able to locate any instances of contamination in this case." Tr. at 73:19-20 (Castellano). Dr. Spence responded, "No," and that he "saw no contaminated blanks," Tr. at 73:21-22 (Spence), meaning that he noticed no blank wells in the amplification plate -- use for "template control" -- that "had extraneous drop-in DNA" in their samples, Tr. at 74:8-17 (Spence). The United States' attorney's questioning of

Dr. Spence concluded by noting that, other than those he already highlighted, Dr. Spence found no other errors documented in Radecki's 2001 report. See Tr. at 75:4-14 (Castellano).

DeLeon's attorney then began redirect examination. See Tr. at 76:24 (Gorman). Dr. Spence clarified that the "best practice" Radecki could have followed would have been to have

> recognized that maybe the blood spots on the shirt and the socks might have been from the person that wore the item and you would expect too that DNA would [be] on their own item that they wore but could it be their blood as well. Reserve that for later, do the DNA extraction a month later, do the . . . murder weapon first and any other [low] copy evidence items where you're looking for the perpetrator, go ahead but if you're looking for the victim's DNA such as on the shirt, if you're wrong that happens to just be Mr. [DeLeon's] which was not an important finding. If you run that first, you're creating that risk. Just run that later and look at the murder weapon first. That would simplify the whole thing.

Tr. at 77:22-78:12 (Spence). Additionally, Dr. Spence asserted that, although the SWGDAM procedures did not exist in 2001, "the concept of cross-contamination was common knowledge," and that he "think[s] all the standard operating procedures and . . . manuals were mentioning that contamination is" possible. Tr. at 78:18-25 (Gorman). It was "not like [SWGDAM] were the first people to come up with that," but they were the "first people to generate a set of guidelines that was detailed and explained exactly why there were problems there and why you should do things by certain best practices." Tr. at 79:4-8 (Spence). According to Dr. Spence, it was "already known by . . . most astute people that you needed to be careful about [cross-contamination] so it would be accurate to say that [SWGDAM] memorialized some[thing] . . . that was already best practices back in 2001." Tr. at 79:8-13 (Spence). Dr. Spence stated that he had received training to avoid cross-contamination when he worked at the Indiana State Police Department in 2003, not long after Radecki completed her analysis. See Tr. at 79:15-20 (Spence). A "major part" of his training was "do anything and everything to avoid contamination, especially cross-contamination that might introduce the defendant's DNA on to your evidence samples." Tr. at 79:20-24 (Spence).

Dr. Spence reiterated that "reference samples [that] are rich in DNA you would want to do last." Tr. at 80:4-5 (Spence).

DeLeon's attorney then offered Dr. Spence an opportunity to clarify his use of the word "catastrophic." Tr. at 80:6-10 (Spence). Dr. Spence explained that "it's [the defendant's] disaster if you get that kind of cross-contamination event and nobody will know that it happened," because "it's just going to look like good evidence on the DNA that shows they're there when it may have been introduced by a [mishandling]." Tr. at 80:14-20 (Spence). DeLeon's attorney also wanted to clarify if Dr. Spence saw "absolute evidence that there was cross-contamination" when he did not find the blanks[9] to have been contaminated. Tr. at 80:22-23 (Spence). Dr. Spence stressed that the aerosols[10] that might cross-contaminate would not have been visible, and that clean blanks do not mean that there was no cross-contamination. See Tr. at 80:25-81:12 (Spence). In particular, Dr. Spence said that there have been "many undocumented instances where there were terrible cross-contamination events and all the blanks were clean." Tr. at 81:10-12 (Spence). See Tr. at 83:22-25 (Spence). The questioning of Dr. Spence concluded with the United States' attorney asking a clarifying question what the terms "high copy" and "low copy" mean, and what they mean in the context of Radecki's work. Tr. at 84:11-85:20 (Castellano, Spence).

After Dr. Spence stepped down, the Court asked the United States what it specifically wants excluded. See Tr. at 86:12-20 (Court). The United States' attorney stated that he is worried that Dr. Spence is a "loose [cannon]," meaning that he can "certainly testify about proper procedures and proper handling of evidence in a laboratory," but that Dr. Spence easily can begin

[9]"Blanks" refers to the wells in the amplification plate that were not deliberately filled with samples.

[10]An "aerosol" is a "suspension of fine solid or liquid particles in gas." Aerosol, Merriam Webster, https://www.merriam-webster.com/dictionary/aerosol (last visited September 14, 2021).

asserting "it could go wrong and it did go wrong or the analyst wasn't thinking about this or was thinking about that." Tr. at 86:23-87:12 (Castellano). The Court indicated that it would "cut back on some of that language." Tr. at 87:19 (Court). The United States argued that "I really don't know that we need [Dr. Spence's] testimony, because through cross-examination all of these things could be highlighted." Tr. at 88:14-17 (Castellano). The United States suggested that Radecki could be "questioned about the order in which she did things, and be impeached with the fact that she didn't follow certain guidelines, if that's the case." Tr. at 88:17-20 (Castellano). The Court stated that Dr. Spence helps, because "you have somebody on [DeLeon's] side." Tr. at 88:22-23 (Court). The Court observed that Dr. Spence articulates standards but then says he "doesn't see any evidence of those, and that's probably about it I'm thinking." Tr. at 89:6-7 (Court). When the United States expressed worry about Dr. Spence using the phrase "no appropriate sense of caution," the Court noted that "he's agreed he can't say that." Tr. at 90:10-13 (Castellano, Court). The United States expressed the same worry about Dr. Spence asserting that it was "fundamentally flawed [to] handle a DNA rich . . . source of blood . . . prior to handling the small quantities." Tr. at 90:16-29 (Castellano). The Court stated that Dr. Spence "can say that in the abstract[, because] I think that's his opinion and I think he can offer it." Tr. at 90:20-22 (Castellano). The United States' third worry is from page three of Dr. Spence report, "which says considering the . . . defective processing of [DeLeon's] bloody shirt . . . the DNA conclusions are problematic," and the United States asked that "we just need to [consider] wording a little bit more carefully." Tr. at 91:1-6 (Castellano). The Court agreed with the United States "on the word problematic" and stated that it would be "more comfortable with [using the phrase 'create risks']," in part because it "communicates better to the jury anyway." Tr. at 91:9-15 (Court).

The hearing concluded with the Court stating that Dr. Spence using the phrase

"catastrophic" would "create confusion," but that DeLeon's attorney "can borrow the word" for her argument. Tr. at 92:5-10 (Court). The Court stated that it "like[d] the way [DeLeon's attorney] put it [--] these create risk of error [--] and I think that's what you're trying to get, because like you say he can't say this one was flawed, he can only say the methodology was [flawed]." Tr. at 93:14-18 (Court). After DeLeon's attorney acknowledged that "we're in agreement," Tr. at 94:9-10 (Gorman), the Court said that it would "try to write something up and script it out, but I think 99 percent of it we know where we're going and I'll try to script out . . . these delicate areas and get something to you so you have clear guidance going into the trial." Tr. at 94:11-16 (Court).

LAW REGARDING EXPERT TESTIMONY

"Since the Supreme Court of the United States decided Daubert . . . , trial courts have had the responsibility to make certain that proffered experts will assist the jury in understanding the evidence and in determining the factual issues it must decide." United States v. Gutierrez-Castro, 805 F. Supp. 2d 1218, 1224 (D.N.M. 2011)(Browning, J.). "The Court now must not only decide whether the expert is qualified to testify, but, under Daubert, whether the opinion testimony is the product of a reliable methodology." United States v. Gutierrez-Castro, 805 F. Supp. 2d at 1224. "Daubert . . . requires a court to scrutinize the proffered expert's reasoning to determine if that reasoning is sound." United States v. Gutierrez-Castro, 805 F. Supp. 2d at 1224.

1. Rule 702.

Rule 702 of the Federal Rules of Evidence governs the admissibility of expert testimony:

> A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:
>
> **(a)** the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
>
> **(b)** the testimony is based on sufficient facts or data;
>
> **(c)** the testimony is the product of reliable principles and methods; and

> **(d)** the expert has reliably applied the principles and methods to the facts of the case.

Fed. R. Evid. 702. Rule 702 thus requires the trial court to "determine whether the expert is proposing to testify to (1) scientific, technical, or other specialized knowledge that (2) will assist the trier of fact to understand or determine a fact in issue." United States v. Muldrow, 19 F.3d 1332, 1337 (10th Cir. 1994). Rule 702 uses a liberal definition of "expert." Fed. R. Evid. 702 advisory committee's note to 1972 proposed rules ("[W]ithin the scope of this rule are not only experts in the strictest sense of the word, e.g., physicians, physicists, and architects, but also the large group sometimes called 'skilled' witnesses, such as bankers or landowners testifying to land values."). An expert is "required to possess such skill, experience or knowledge in that particular field as to make it appear that his opinion would rest on substantial foundation and would tend to aid the trier of fact in his search for truth." LifeWise Master Funding v. Telebank, 374 F.3d 917, 928 (10th Cir. 2004).

In United States v. Goxcon-Chagal, 886 F. Supp. 2d 1222, 1239 (D.N.M. 2012)(Browning, J.), the Court identified as relevant, and admitted, testimony on:

> (ii) the likelihood that a drug organization would entrust individuals outside of the organization with a large amount of drugs; (iii) the significance of the presence of multiple cellular telephones in the vehicle; (iv) the significance of the possession of multiple license plates; (v) the separation of individuals who package drugs and individuals who are drug couriers within a drug organization; (vi) the significance of the presence of multiple air fresheners in the vehicle; and (vii) the significance of the presence of a firearm in the vehicle.

886 Supp. 2d at 1239. The Court did not admit testimony on whether a highway portion was a "drug route," because the "proposed testimony is too close to characterizing 'nearly any trip down the interstate' as traveling in a known drug route" United States v. Goxcon-Chagal, 886 F. Supp. 2d at 1247. See United States v. Harry, 20 F. Supp. 3d 1196, 1243 (D.N.M. 2014)(Browning, J.)(deeming inadmissible testimony on a sex crime's victim's demeanor during

an examination, because "demeanor is not always a reliable indicator whether someone is telling the truth, especially about sex -- then no expert testimony is needed. That knowledge is well within the knowledge of jurors and most people."); United States v. Rodella, No. CR 14-2783 JB, 2014 WL 6634310, at *25 (D.N.M. Nov. 19, 2014)(Browning, J.)(stating that "testimony regarding nationally accepted police standards is irrelevant" to issues of "excessive force and" reasonableness). The proponent of expert testimony has the burden of establishing by a preponderance of the evidence that the pertinent admissibility requirements are met.[11] See Morales v. E.D. Etnyre & Co., 382 F. Supp. 2d 1252, 1266 (D.N.M. 2005)(Browning, J.)(citing Bourjaily v. United States, 483 U.S. 171, 175 (1987)). Once the trial court has determined that expert testimony would be helpful to the trier of fact, a witness "may qualify as an expert by knowledge, skill, experience, training, or education and . . . the expert . . . should not be required to satisfy an overly narrow test of his own qualifications." Gardner v. Gen. Motors Corp., 507 F.2d 525, 528 (10th Cir. 1974)(internal quotation marks

[11]The Court is clipping the wings of experts all the time. See, e.g., Abraham v. WPX Prod. Prods., LLC, 184 F. Supp. 3d at 1204 (precluding an expert from discussing class certification requirements, but allowing the expert to testify to information about royalty instruments); United States v. Rodriguez, 125 F. Supp. 3d at 1255-56 (permitting an expert to describe a cartel's structure and organization, and to explain drug running, but not admitting the expert's testimony opining that the defendant was running drugs); Montoya v. Sheldon, 286 F.R.D. at 619 (precluding a treating physician from testifying about a party's PTSD diagnosis, opinions about the causes for a party's symptoms, or a party's prognosis). Attorneys ask experts to do too much, and experts try to do too much. The experts are being paid; they are trying to be helpful to the attorney. Cf. Mark I. Bernstein, Jury Evaluation of Expert Testimony under the Federal Rules, Drexel L.R. 239, 268 (2015)("Any use of expert witnesses paid by a party raises concerns of partisanship, competency, and honesty. Because experts are partisan witnesses paid by a party, there is an inevitable danger of bias.). The experts will often do anything. They toss statements into their reports to be helpful. Too many attorneys release the report as written -- without editing and without trimming. This failure to edit and to trim creates unnecessary litigation. Many expert reports contain statements that the proponent attorney does not need or even want. The reports draw Daubert motions or rule 702 challenges. The proponent is then forced to defend the statements.

omitted). See United States v. Rodella, 2014 WL 6634310, at *20 ("Because of [the proposed expert's] lack of practical experience, lack of nationwide experience, and lack of an advanced degree in criminology or law enforcement, [the proposed expert] is not qualified to testify about nationally accepted police procedures and practices."); United States v. Goxcon-Chagal, 886 F. Supp. 2d at 1245 (determining an expert qualified to testify to drug trafficking when he had personal knowledge of the subject from working in the Drug Enforcement Agency for almost fifteen years).

Courts should, under the Federal Rules of Evidence, liberally admit expert testimony, see United States v. Gomez, 67 F.3d 1515, 1526 (10th Cir. 1995)(describing rule 702 as a "liberal standard"), and the trial court has broad discretion in deciding whether to admit or exclude expert testimony, see Werth v. Makita Elec. Works, Ltd., 950 F.2d 643, 647 (10th Cir. 1991)(noting the trial court's decision will not be overturned "unless it is manifestly erroneous or an abuse of discretion"). "The Tenth Circuit appears to draw a line between expert testimony regarding credibility and expert testimony regarding voluntariness." United States v. Ganadonegro, 805 F. Supp. 2d 1188, 1214 (D.N.M. 2011)(Browning, J.)(citing United States v. Benally, 541 F.3d 990, 996 (10th Cir. 2008)). "The Tenth Circuit may draw this distinction because, generally, it is the jury's exclusive function to make credibility determinations . . . whereas a court makes a pretrial determination of the constitutional voluntariness of a statement." United States v. Ganadonegro, 805 F. Supp. 2d at 1214 (citation omitted)(citing United States v. Adams, 271 F.3d 1236, 1245 (10th Cir. 2001)).

2. The Daubert Standard.

In its gatekeeper role, a court must assess the reasoning and methodology underlying an expert's opinion, and determine whether it is both scientifically valid and relevant to the facts of

the case, i.e., whether it is helpful to the trier of fact. See Daubert, 509 U.S. at 594-95; Witherspoon v. Navajo Ref. Co., No. 03-1160, 2005 WL 5988649, at *2 (D.N.M. July 18, 2005)(Black, J.)(citing Dodge v. Cotter Corp., 328 F.3d 1212, 1221 (10th Cir. 2003)). The Supreme Court articulated a non-exclusive list of factors that weigh into a district court's first-step reliability determination, including: (i) whether the method has been tested; (ii) whether the method has been published and subject to peer review; (iii) the error rate; (iv) the existence of standards and whether the witness applied them in the present case; and (v) whether the witness' method is generally accepted as reliable in the relevant medical and scientific community. See Daubert, 509 U.S. at 594-95. The district court is also to consider whether the witness' conclusion represents an "unfounded extrapolation" from the data; whether the witness has adequately accounted for alternative explanations for the effect at issue; whether the opinion was reached for the purposes of litigation or as the result of independent studies; or whether it unduly relies on anecdotal evidence. See Witherspoon v. Navajo Ref. Co., 2005 WL 5988649, at *3 (citing Gen. Elec. Co. v. Joiner, 522 U.S. 136, 146 (1997)). The Tenth Circuit stated the applicable standard in Norris v. Baxter Healthcare Corp., 397 F.3d 878 (10th Cir. 2005):

> Rule 702 requires the district court to "ensure that any and all scientific testimony or evidence is not only relevant, but reliable." Bitler v. A.O. Smith Corp., 391 F.3d 1114, 1120 (10th Cir. 2004)(quoting Daubert, 509 U.S. at 589 . . .). This obligation involves a two-part inquiry. Id. "[A] district court must [first] determine if the expert's proffered testimony . . . has 'a reliable basis in the knowledge and experience of his [or her] discipline.'" Id. (quoting Daubert, 509 U.S. at 592 . . .). In making this determination, the district court must decide "whether the reasoning or methodology underlying the testimony is scientifically valid. . . ." Id. (quoting Daubert, 509 U.S. at 592-93 . . .). Second, the district court must further inquire into whether proposed testimony is sufficiently "relevant to the task at hand." Daubert, 509 U.S. at 597 . . . .

Norris v. Baxter Healthcare Corp., 397 F.3d at 883-84 (footnote omitted). "The second inquiry is related to the first. Under the relevance prong of the Daubert analysis, the court must ensure that

the proposed expert testimony logically advances a material aspect of the case. . . . The evidence must have a valid scientific connection to the disputed facts in the case." Norris v. Baxter Healthcare Corp., 397 F.3d at 884 n.2 (citing Daubert v. Merrell Dow Pharm., Inc., 43 F.3d 1311, 1315 (9th Cir. 1995)(on remand from the Supreme Court); Daubert, 509 U.S. at 591). If the expert's proffered testimony fails on the first prong, the court does not reach the second prong. See Norris v. Baxter Healthcare Corp., 397 F.3d at 884. In Kumho Tire Co. v. Carmichael, 526 U.S. 137 (1999), the Supreme Court expanded the rules under Daubert to non-scientific expert testimony. See Kumho Tire Co. v. Carmichael, 526 U.S. at 141 ("We conclude that Daubert's general holding -- setting forth the trial judge's general 'gatekeeping' obligation -- applies not only to testimony based on 'scientific' knowledge, but also to testimony based on 'technical' and 'other specialized' knowledge." (quoting Carmichael v. Samyang Tires, Inc., 923 F. Supp. 1514, 1521 (S.D. Ala. 1996)). The Supreme Court recognized in Kumho Tire Co. v. Carmichael that the factors from Daubert will not apply to all cases:

> Our emphasis on the word "may" thus reflects Daubert's description of the Rule 702 inquiry as a flexible one. Daubert makes clear that the factors it mentions do not constitute a definitive checklist or test. And Daubert adds that the gatekeeping inquiry must be tied to the facts of a particular case.

Kumho Tire Co. v. Carmichael, 526 U.S. at 150 (internal quotation marks omitted).

In conducting its review under Daubert, a court must focus generally on "principles and methodologies, and not on the conclusions generated." Armeanu v. Bridgestone/Firestone N. Am., Tire, LLC, No. CIV 05-0619, 2006 WL 4060665, at *11 (D.N.M. Sept. 26, 2006)(Browning, J.)(citing Daubert, 509 U.S. at 595). "Despite this focus on methodology, an expert's conclusions are not immune from scrutiny . . . and the court may conclude that there is simply too great an analytical gap between the data and the opinion proffered." Armeanu v. Bridgestone/Firestone N. Am., Tire, LLC, 2006 WL 4060665, at *11 (alterations and internal

quotation marks omitted)(quoting Dodge v. Cotter Corp., 328 F.3d at 1222). The proponent of the expert's opinion testimony bears the burden of establishing that the expert is qualified, that the methodology he or she uses to support his or her opinions is reliable, and that his or her opinion fits the facts of the case and thus will be helpful to the jury. See Norris v. Baxter Healthcare Corp., 397 F.3d at 881. The Tenth Circuit noted in Hollander v. Sandoz Pharm. Corp., 289 F.3d 1193 (10th Cir. 2002):

> Because the district court has discretion to consider a variety of factors in assessing reliability under Daubert, and because, in light of that discretion, there is not an extensive body of appellate case law defining the criteria for assessing scientific reliability, we are limited to determining whether the district court's application of the Daubert manifests a clear error of judgment or exceeds the bounds of permissible choice in the circumstances. . . . Thus, when coupled with this deferential standard of review, Daubert's effort to safeguard the reliability of science in the courtroom may produce a counter-intuitive effect: different courts relying on the essentially the same science may reach different results.

289 F.3d at 1206. The United States Court of Appeals for the Ninth Circuit noted in Claar v. Burlington N.R.R., 29 F.3d 499 (9th Cir. 1994):

> Coming to a firm conclusion first and then doing research to support it is the antithesis of this method. Certainly, scientists may form initial tentative hypotheses. However, scientists whose conviction about the ultimate conclusion of their research is so firm that they are willing to aver under oath that it is correct prior to performing the necessary validating tests could properly be viewed by the district court as lacking the objectivity that is the hallmark of the scientific method.

29 F.3d at 502-03.

> Once reliability is established, however, it is still within the district court's discretion to determine whether expert testimony will be helpful to the trier of fact. In making that determination, the court should consider, among other factors, the testimony's relevance, the jurors' common knowledge and experience, and whether the expert's testimony may usurp the jury's primary role as the evaluator of evidence.

Ram v. N.M. Dep't of Env't, No. CIV 05-1083, 2006 WL 4079623, at *10 (D.N.M. Dec. 15, 2006)(Browning, J.)(citing United States v. Rodriguez-Felix, 450 F.3d 1117, 1123 (10th Cir. 2006)).

An untested hypothesis does not provide a scientific basis to support an expert opinion. See Norris v. Baxter Healthcare Corp., 397 F.3d at 887 ("[A]t best, silicone-associated connective tissue disease is an untested hypothesis. At worst, the link has been tested and found to be untenable. Therefore, there is no scientific basis for any expert testimony as to its specific presence in Plaintiff."); In re Breast Implant Litig., 11 F. Supp. 2d 1217, 1228 (D. Colo. 1998)(Sparr, J.)("An untested hypothesis cannot be a scientifically reliable basis for an opinion on causation."). A court is not required "to admit opinion evidence that is connected to existing data only by the ipse dixit of the expert. The court may conclude that there is simply too great an analytical gap between the data and the opinion proffered." Gen. Elec. Co. v. Joiner, 522 U.S. at 146. See Hollander v. Sandoz Pharm. Corp., 289 F.3d at 1209 (noting a lack of similarity between animal studies and human studies); Tyler v. Sterling Drug, Inc., 19 F. Supp. 2d 1239, 1244 (N.D. Okla. 1998)(Cook, J.)("Test results on animals are not necessarily reliable evidence of the same reaction in humans."). Courts have excluded experts' opinions when the experts depart from their own established standards. See Truck Ins. Exch. v. MagneTek, Inc., 360 F.3d 1206, 1213 (10th Cir. 2004)("The district court noted that [the expert]'s opinion did not meet the standards of fire investigation [the expert] himself professed he adhered to."); Magdaleno v. Burlington N.R.R., 5 F. Supp. 2d 899, 905 (D. Colo. 1998)(Babcock, J.)("In sum, [the expert]'s methodology is not consistent with the methodologies described by the authors and experts whom [the expert] identifies as key authorities in his field.").

3. Necessity of Evaluating an Issue Under Daubert.

The restrictions in Daubert apply to both "novel" expert testimony and "well-established propositions." 509 U.S. at 593 n.11 ("Although the Frye[12] decision itself focused exclusively on

[12]Frye v. United States, 293 F. 1013 (D.C. Cir. 1923), superseded by rule 702 of the Federal

'novel' scientific techniques, we do not read the requirements of Rule 702 to apply specially or exclusively to unconventional evidence."). "Of course, well-established propositions are less likely to be challenged than those that are novel, and they are more handily defended." Daubert, 509 U.S. at 593 n.11. "Indeed, theories that are so firmly established as to have attained the status of scientific law, such as the laws of thermodynamics, properly are subject to judicial notice under Federal Rule of Evidence 201." Daubert, 509 U.S. at 593 n.11.

"[W]hen experts employ established methods in their usual manner, a district court need not take issue under Daubert. . . ." Att'y Gen. of Okla. v. Tyson Foods, Inc., 565 F.3d 769, 780 (10th Cir. 2009). "[H]owever, where established methods are employed in new ways, a district court may require further indications of reliability." Att'y Gen. of Okla. v. Tyson Foods, Inc., 565 F.3d at 780. Whether courts have accepted theories underlying an expert's opinion is a relevant consideration in determining whether expert testimony is reliable. See Att'y Gen. of Okla. v. Tyson Foods, Inc., 565 F.3d at 780 ("The case law indicates that the courts are not unfamiliar with the PCR methodology, and in fact some courts have indicated their acceptance of it."). See Rawers v. United States, No. CIV 19-0034 JB/CG, 2021 WL 2634884, at *34 (D.N.M. Jan. 25 , 2021)(Browning, J.).

ANALYSIS

The United States argues: (i) DeLeon's expert disclosure does not meet the requirements of rule 16 of the Federal Rules of Criminal Procedure; (ii) DeLeon does not demonstrate that Dr. Spence reliably applied relevant scientific principles to the case's facts; and (iii) if the Court allows Dr. Spence to testify about DNA cross-contamination, it should bar Dr. Spence from testifying

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Rules of Evidence, held that, for an expert opinion to be admissible, "the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs." 293 F. at 1014.

about the likelihood of cross-contamination. Motion at 2-5. The Court concludes that: (i) DeLeon's disclosure meets rule 16(b)(1)(C)'s requirements, because it was timely and offers an appropriate summary of Dr. Spence's proposed testimony; (ii) DeLeon demonstrates that Dr. Spence applied reliably industry-accepted principles when analyzing Radecki and Tokumaru's analyses; and (iii) Dr. Spence (a) may testify about the risk of cross-contamination generally, and about the procedures the Crime Lab followed when testing evidence recovered from the scene of the alleged murder of Frank Castillo in March, 2001, and whether those procedures could have allowed for DNA cross-contamination; (b) may not testify about the procedures the Crime Lab did or did not follow -- or the likelihood of cross-contamination -- if, to form an opinion, Dr. Spence must speculate about what the Crime Lab did; and (c) may not testify that Tokumaru's reanalysis of the collected DNA samples demonstrates that the detection of DeLeon's DNA on the murder weapon is not scientifically reproducible. Accordingly, the Court will grant the Motion in part and deny the Motion in part.

I. THE NOTICE OF DR. SPENCE'S TESTIMONY MEETS RULE 16'S REQUIREMENTS, BECAUSE IT WAS TIMELY AND OFFERS AN APPROPRIATE SUMMARY OF DR. SPENCE'S PROPOSED TESTIMONY.

First, the United States contends that DeLeon's notice does not meet rule 16's requirements, because it does not provide an "adequate explanation of the opinions or the bases and reasons for the opinion that Dr. Spence intends to express," and that it is "unclear . . . what laboratory experiments, if any, Dr. Spence has performed in this case." Motion at 3. Rule 16(b)(1)(C) states:

> (C) **Expert witnesses**. -- The defendant must, at the government's request, give to the government a written summary of any testimony that the defendant intends to use under Rules 702, 703, or 705 of the Federal Rules of Evidence as evidence at trial, if --
>
> (i) the defendant requests disclosure under subdivision (a)(1)(G) and

> the government complies; or
>
> (ii) the defendant has given notice under Rule 12.2(b) of an intent to present expert testimony on the defendant's mental condition.
>
> This summary must describe the witness's opinions, the bases and reasons for those opinions, and the witness's qualifications.

Fed. R. Crim. P. 16(b)(1)(C). Additionally, "[i]f a party fails to comply with this rule, the court may . . . prohibit that part from introducing the undisclosed evidence; or . . . enter any other order that it just under the circumstances." Fed. R. Crim. P. 16(d)(2)(C), (D). Even if a party fails to comply with rule 16, it would be "a rare case where, absent bad faith, a district court should exclude evidence rather than continue the proceedings." United States v. Golyanksy, 291 F.3d 1245, 1249 (10th Cir. 2002). Rule 16 requires a "*summary* of the expected testimony, not a list of topics." United States v. Duvall, 272 F.3d 825, 828-29 (7th Cir. 2001)(emphasis in original).

DeLeon's notice meets rule 16's requirements, because it offers a summary of Dr. Spence's proposed testimony. See Notice at 1-3. The Notice identifies Dr. Spence as a "forensic DNA consultant," and explains that he has been "working in the field of DNA and forensic biology for close to twenty years." Notice at 1. DeLeon states that Dr. Spence "will testify that the processing of Mr. DeLeon's blood t-shirt samples in May of 2001 with[ ]the samples from the murder weapon in this case was problematic[, because it led] to potential cross-contamination." Notice at 2. DeLeon also plans to have Dr. Spence "testify as to the 2014 DNA testing of the murder weapon and explain the significance of the results of that testing." Notice at 2. DeLeon attaches Dr. Spence's report to the end of the Notice. See Spence Report at 1-5. The Notice and its attachments are far more than a "short description of what he might testify to." United States v. Shulick, 994 F.3d 123, 138 (3d Cir. 2021)(noting that a district court did not err when it found a "curriculum vitae and a short description of what he might testify to" insufficient under rule 16).

The United States' arguments are inapposite. Rule 16 does not impose a requirement that a party provide an "adequate explanation of the opinions or bases" for the proposed expert's opinion, nor does it require that the proposed expert have performed laboratory experiments. Motion at 3. See Fed. R. Crim. P. 16(b)(1)(C). The Notice meets rule 16's requirements.

II. DR. SPENCE APPLIES RELIABLY INDUSTRY-ACCEPTED PRINCIPLES WHEN ANALYZING RADECKI'S AND TOKUMARKU'S ANALYSES.

Second, the United States argues that The Court should not allow Dr. Spence to testify, because the Notice "does not provide the requisite indicia of reliability to that testimony." Motion at 3. The United States "does not challenge Dr. Spence's qualifications, but does challenge whether the proffered opinion is reliable for the simple reason that his report is apparently based solely on his review of discovery provided by the United States and not any independent laboratory testing." Motion at 4. The United States asks that the Court not allow Dr. Spence to testify or, alternatively, that the Court "hold a Daubert hearing to determine whether Dr. Spence reliably applied the methods of DNA cross-contamination." Motion at 4. After the hearing, the Court concludes that -- notwithstanding limitations the Court places on Dr. Spence's testimony as explained elsewhere in this Memorandum Opinion and Order -- Dr. Spence may testify, because he reliably applies SWGDAM's industry-accepted principles to Radecki's and Tokumaru's analyses.

A district court's role under rule 702 is two-fold. See United States v. Rodriguez-Felix, 450 F.3d 1117, 1122 (10th Cir. 2006). To determine whether the proposed expert testimony is "both reliable and relevant, in that it will assist the trier of fact, before permitting a jury to assess such testimony," a court must determine: (i) "whether the expert is qualified 'by knowledge, skill, experience, training, or education' to render an opinion; and, if so, (ii) "whether the expert's opinion is reliable by assessing the underlying reasoning and methodology, as set forth in

Daubert." United States v. Nacchio, 555 F.3d 1234, 1241 (10th Cir. 2009)(quoting United States v. Rodriguez-Felix, 450 F.3d at 1122, then Fed. R. Evid. 702). Daubert's nonexhaustive list of reliability factors include: (i) whether the method has been tested; (ii) whether the method has been published and subject to peer review; (iii) the error rate; (iv) the existence of standards and whether the witness applied them in the present case; and (v) whether the witness' method is generally accepted as reliable in the relevant medical and scientific community. See Daubert v. Merrell Dow Pharmaceuticals, 509 U.S. at 594-95.

Because the United States does not challenge Dr. Spence's qualifications, see Motion at 4, and the Court agrees that Dr. Spence is qualified, see United States v. Sedillo, No. CR 10-2085 WJ, 2011 WL 13286206, at *1 (Jan. 19, 2011)(Johnson, J.)[13], the analysis hinges on whether Dr. Spence's opinions are reliable, see United States v. Nacchio, 555 F.3d at 1241. At the most basic level, Dr. Spence's proposed testimony is that Radecki's 2001 analysis of the evidence from the alleged murder did not follow today's industry standards to avoid cross-contamination and that, as a result, there may have been cross-contamination, although he cannot be sure. See Notice at 1-3; Tr. at 47:6-21 (Spence). Dr. Spence's proposed testimony is, therefore, largely a comparison between what the records of Radecki's analysis state and the SWGDAM guidelines. See Tr. at 63:11-13 (Spence).

SWGDAM is "a group of approximately fifty scientists representing federal, state, and local forensic DNA laboratories in the United States and Canada." United States v. Barton, 909 F.3d 1323, 1328 (11th Cir. 2018). SWGDAM "serves as a forum to discuss, share, and evaluate

[13]In United States v. Sedillo, Judge Johnson concluded that "the Court is satisfied that he is qualified under Daubert to offer an option in forensic DNA," because his background and experience are sufficient for him to "offer expert testimony on the theory of DNA transfer." 2011 WL 13286206, at *1.

forensic methods, protocols, training, and research to enhance forensic biology services as well as provide recommendations to the FBI Director on quality assurance standards for forensic DNA analysis." Scientific Working Group on DNA Analysis Methods (SWGDAM) (https://www.swgdam.org/bylaws)(last visited August 27, 2021). SWGDAM's guidelines "did not create minimum standards for DNA analysis," but "may be probative of reliability." United States v. Barton, 834 F. App'x 529, 532 (11th Cir. 2020). Although following SWGDAM's guidelines is, of course, no guarantee of the results' accuracy or reliability, the guidelines themselves are reliable benchmarks against which to compare DNA analyses for accuracy.

The United States' contention that Dr. Spence's conclusions are unreliable, because they are solely a meta-analysis of existing work, rather than based on Dr. Spence's own independent laboratory tests, misunderstands rule 702's standard. See Motion at 4. Rule 702 does not require proposed experts to base their opinions on their own independent laboratory tests. See Fed. R. Evid. 702. Rather, rule 702 requires the expert to have "reliably applied the principles and methods to the facts of the case." Fed. R. Evid. 702. Dr. Spence studied Radecki's and Tokumaru's work and noticed that Radecki's work could have created a risk of cross-contamination. See Spence Report at 1-73. Were Dr. Spence proposing to testify that, if SWGDAM procedures had been followed, DeLeon's DNA would not have been found on the murder weapon, the United States' contention that Dr. Spence's opinion is unreliable, because he has not applied principles and methods to the facts of this case, would be accurate. The Court's conclusion that Dr. Spence may not testify why Radecki's conclusions are flawed or insinuate that Radecki's analysis was "catastrophic" is based on this contention. Dr. Spence is not, however, proposing to testify what new tests show or would show. See Notice at 1-3. Consequently, any of Dr. Spence's opinions that compare SWGDAM's guidelines with Radecki's and Tokumaru's processes of DNA analysis,

with an eye towards probing the accuracy of their results, are reliable under Daubert and therefore admissible under rule 702.

III. DR. SPENCE MAY TESTIFY ABOUT THE RISKS OF CROSS-CONTAMINATION AND THE PROCEDURES THE CRIME LAB FOLLOWED, BUT MAY NOT TESTIFY BASED ON SPECULATION OR THAT RADECKI'S RESULTS ARE NOT SCIENTIFICALLY REPRODUCIBLE.

Third, the United States argues that Dr. Spence should not be allowed to testify about the likelihood of DNA cross-contamination, because he has not "tested the transfer rates of the materials in this case." Motion at 5. The United States' argument is another challenge to the reliability of Dr. Spence's proposed testimony. See Daubert v. Merrell Dow Pharmaceuticals, 509 U.S. at 597 (explaining that, under rule 702, a trial judge "has the task of ensuring that an expert's testimony rests on a reliable foundation and is relevant to the task at hand"). The Court concludes that Dr. Spence may not testify about the likelihood of cross-contamination, that Radecki's results are not scientifically reproducible, that Radecki's analysis or her conclusions were "catastrophic" or "disastrous," assert that Radecki used "no appropriate sense of caution," or offer any other opinion if Dr. Spence must speculate about what actually happened during Radecki's or Tokumaru's analyses.

For Dr. Spence to testify about the likelihood of cross-contamination, he would have to have conducted enough tests of the evidence to know that, on any given test, with a given set of safeguards in place, there is a given likelihood of cross-contamination. Dr. Spence has not done this analysis. See Spence Report at 1-73. Moreover, even if he had done this analysis, there would be myriad confounding variables -- temperature, humidity, whether the air was on in the laboratory, the direction the technician breathed, and more. See Spence Report at 2 (explaining that SWGDAM guidelines make recommendations regarding ventilation and airflow). Consequently, "[w]ithout independent testing applicable to the facts of this case, testimony as to

the likelihood of secondary or tertiary transfer is speculative." United States v. Sedillo, 2011 WL 13286206, at *2. As Chief Judge Johnson, then-United States District Judge for the District of New Mexico has stated, "opining as to the likelihood of [cross-contamination] having happened in this particular case is grounded in speculation." United States v. Sedillo, 2011 WL 13286206, at *2. Dr. Spence may not, therefore, testify about the likelihood of cross-contamination. For the same reasons, Dr. Spence may not testify that Radecki's 2001 analysis was "catastrophic," that Radecki was not considering the possibility of cross-contamination, or any other opinion if, to form the opinion, Dr. Spence must speculate. See Sardis v. Overheard Door Corp., --F.4th--, 2021 WL 3699753, at *6 (4th Cir. 2021)("Specifically, district courts must ensure that an expert's opinion is 'based on scientific, technical, or other specialized *knowledge* and not belief or speculation.'")(quoting Oglesby v. General Motors Corp., 190 F.3d 244, 250 (4th Cir. 1999)(emphasis in original)).

Dr. Spence also may not testify that Tokumaru's 2014 reanalysis of the evidence demonstrates that finding DeLeon's DNA on the murder weapon was not scientifically reproducible. In the Spence Report, Dr. Spence states that "we can conclude – unequivocally -- that, in 2014, Ms. Tokumaru demonstrated that the detection of Angel DeLeon's DNA on the murder weapon was ***not*** scientifically reproducible." Spence Report at 3 (emphasis in original). Dr. Spence's conclusion here is unreliable. As philosopher of science Karl Popper states, "non-reproducible single occurrences are of no significance to science." Karl Popper, The Logic of Scientific Discovery 66 (2002). We cannot conclude from Tokumaru's failure to reproduce Radecki's results that Radecki's results are not reproducible. By extension, Dr. Spence may testify, however, that Tokumaru was unable to reproduce Radecki's results, because that conclusion is not speculative. See Spence Report at 3 (noting that the 2014 analysis "***failed*** to

reproduce a single DNA mixture that may have hinted at the inclusion of Angel DeLeon")(emphasis in original).

IT IS ORDERED that the United States' Motion to Exclude Expert Witness or in the Alternative to Hold a Daubert Hearing, filed June 28, 2021 (Doc. 3293), is granted in part and denied in part. Dr. Spence (a) may testify about the risk of cross-contamination generally, and about the procedures the Crime Lab followed when testing evidence recovered from the scene of the alleged murder of Frank Castillo in March, 2001, and whether those procedures could have allowed for DNA cross-contamination; (b) may not testify about the procedures the Crime Lab did or did not follow, including that Radecki used "no appropriate sense of caution," that her work was "catastrophic" or "disastrous" -- or about the likelihood of cross-contamination -- if, to form an opinion, Dr. Spence must speculate about what the Crime Lab did; and (c) may not testify that Tokumaru's reanalysis of the collected DNA samples demonstrates that the detection of DeLeon's DNA on the murder weapon is not scientifically reproducible.

UNITED STATES DISTRICT JUDGE

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